



## ABSTRACT

This user's guide describes the characteristics, operation, and use of the TAS2764 Evaluation Module. A complete schematic diagram, printed-circuit board layouts, and bill of materials are included in this document.

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## Trademarks

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## 1 Description

The TAS2764 is a mono digital input Class-D audio amplifier optimized for efficiently driving high peak power into small loudspeakers. The Class-D amplifier is capable of delivering 13 W of continuous power into a 4 Ω load with less than 1 % THD+N at a supply voltage of 12 V.

Y-Brige architecture improves overall efficiency at low level of output power and in idle mode. Integrated speaker voltage and current sense provides for real time monitoring of loudspeaker behavior. A supply tracking peak voltage limiter optimizes amplifier headroom. Brownout prevention scheme with multiple thresholds allows reducing the gain in signal path when the supply drops.

Up to eight devices can share a common bus via I2S/TDM and I2C interfaces. The device is available in a 30-ball, 0.4 mm pitch CSP for a compact PCB footprint.

TAS2764EVM supports evaluation and development with the TAS2764 device through the following interfaces:

- USB Interface
- Software control via PurePath™ Console 3 (PPC3) GUI, USB-HID
- USB-class audio device, compatible with Microsoft® Windows® 7+
- External 100-mil headers
- PSIA – I2S/TDM interface
- I2C
- Hardware Shutdown Control
- Interrupt Output

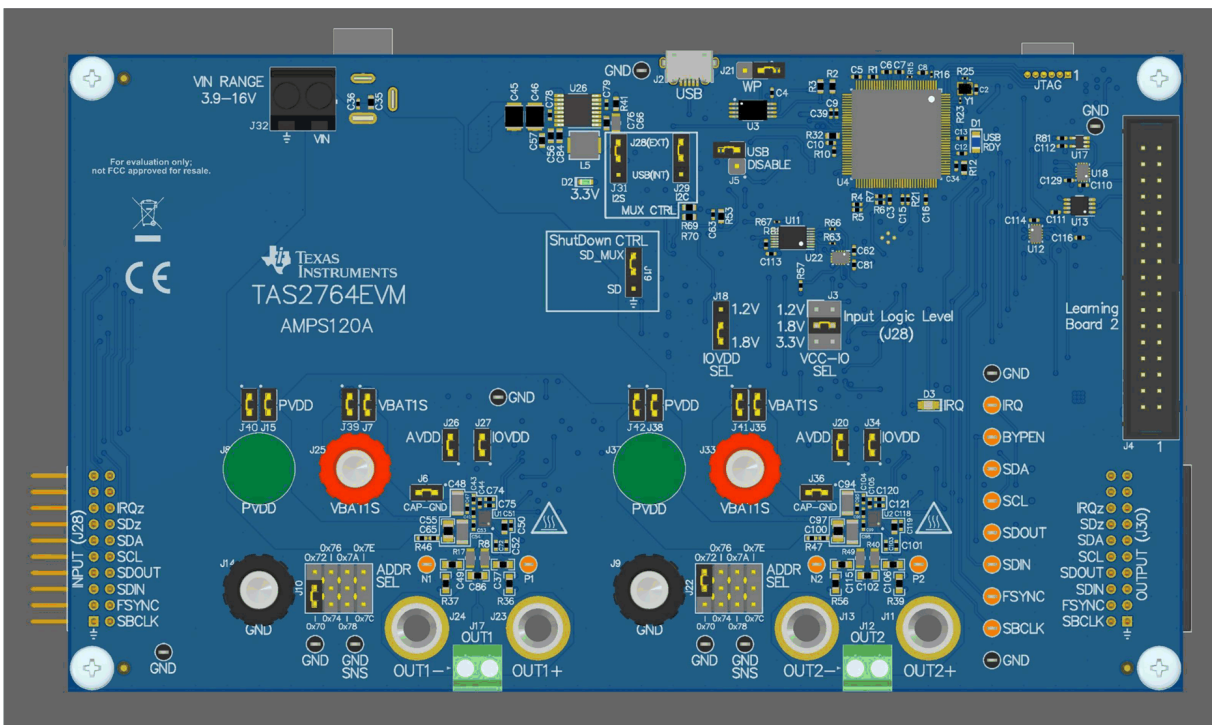


Figure 1-1. TAS2764EVM Top View (3D)

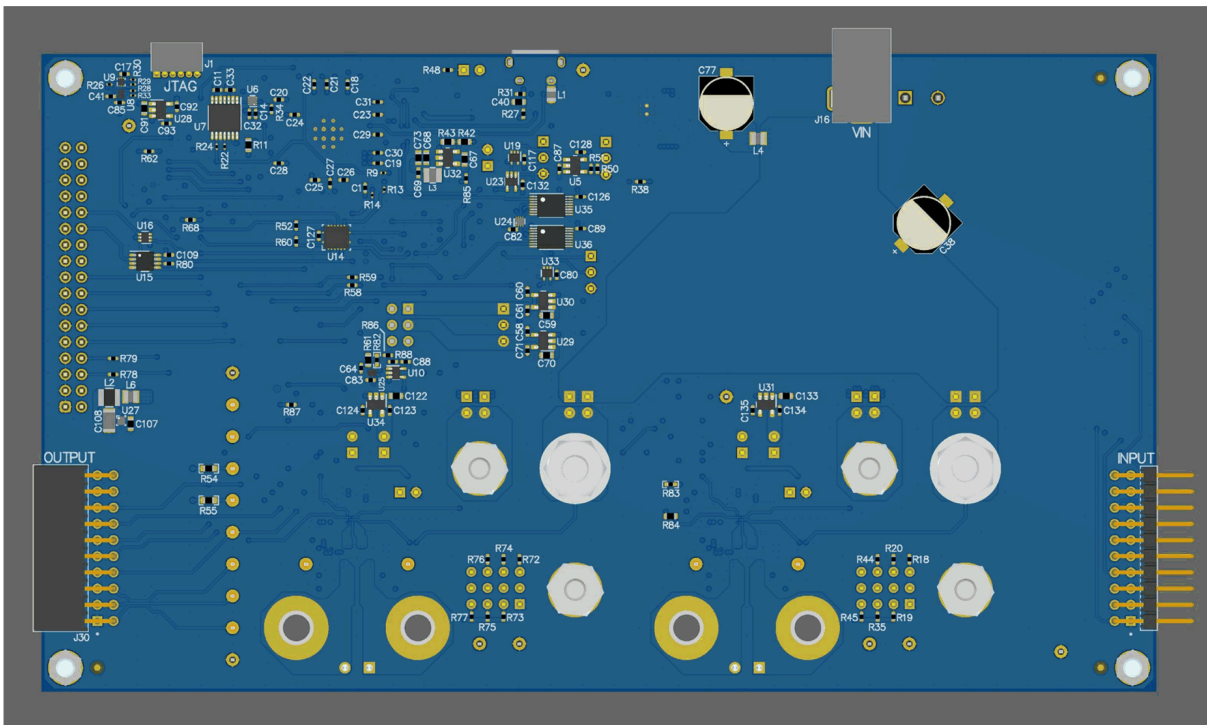


Figure 1-2. TAS2764EVM Bottom View (3D)

## 2 TAS2764EVM Sections Description

Figure TAS2764EVM Sections shows the different EVM sections whose are described in table below.

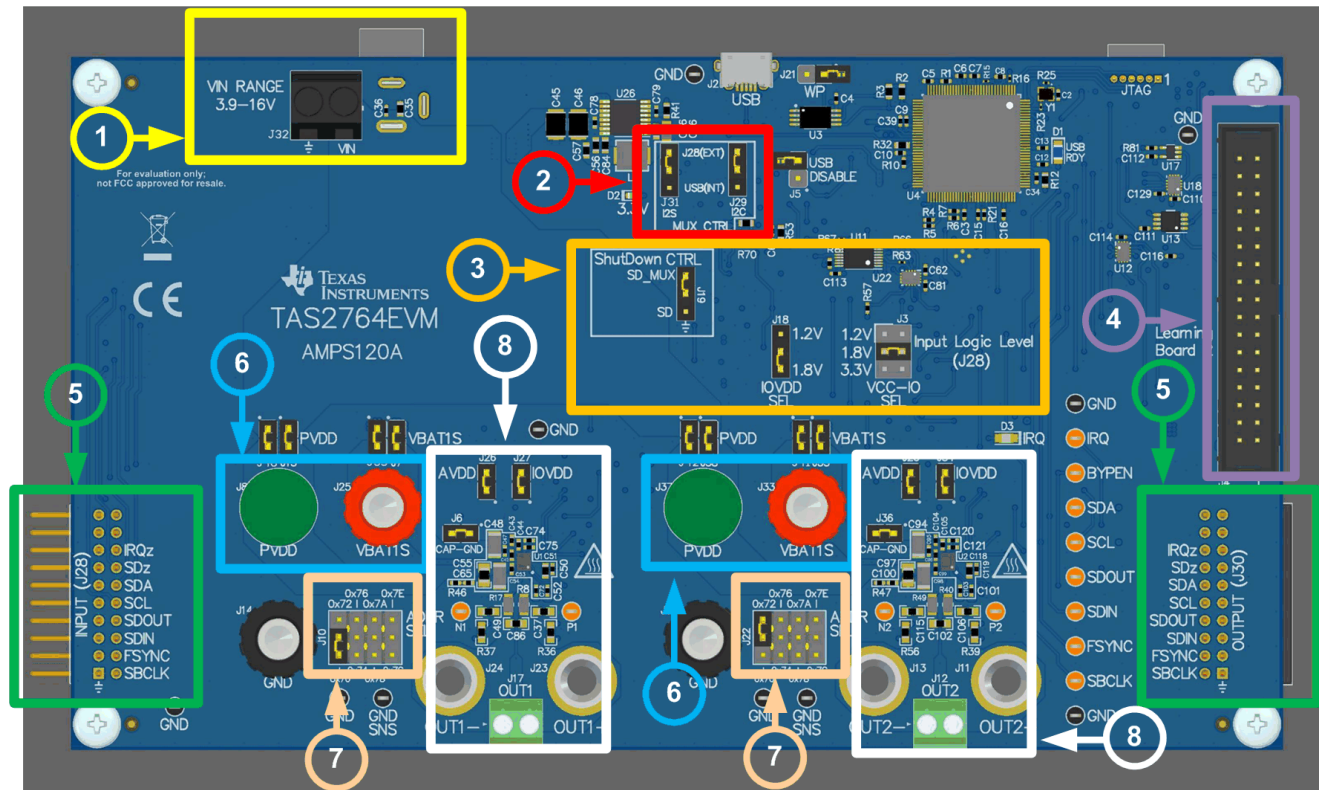


Figure 2-1. TAS2764EVM Sections

Table 2-1. TAS2764EVM Sections Description

Marker	Section Name	Description
1	Power Supply Connectors	Barrel connector and screw connector can be used to connect the power supply in the voltage range of 3.9V to 16V. USE ONE CONNECTOR ONLY.
2	I2S/I2C Source Selectors	Jumpers J31 and J29 are used to select the I2S and I2C source respectively. Place jumpers in position 1-2 for external source (J28). Place jumpers in position 2-3 for internal source (USB).
3	Shutdown and Digital Level Controls	Shutdown control jumper (J19) is used to select the shutdown source. Select 1-2 for shutdown multiplexer (shutdown source depends of jumper J31). Select 2-3 to force shutdown. Jumpers J18 and J3 are used to select the IOVDD power and digital input source levels respectively.
4	Learning Board Connector	Optional connector to learning board.

**Table 2-1. TAS2764EVM Sections Description (continued)**

Marker	Section Name	Description
5	AP/PSIA Connectors	AP/PSIA connectors for external source and multichannel operation. Connect J28 to an AP/PSIA in case different clocks and audio source are required (Jumpers J31 and J29 configured for external source). If additional channels are required, output J30 can be directly connected the input connector J28 of another TAS2764EVM.
6	PVDD and VBAT1S Banana Connectors	Optional banana connectors if another power source is required. Remove jumpers J40, J15, J42 and J38 in case external PVDD is used. Remove jumpers J39, J7, J41 and J35 if external VBAT1S is used.
7	I2C Address Selectors	J10 and J22 are used to select the different I2C addresses. The supported addresses are 0x70, 0x72, 0x74, 0x76, 0x78, 0x7A, 0x7C, 0x7E. DO NOT USE the same address in both channels to avoid communication conflicts.
8	TAS2764 Areas	TAS2764 components area. Speaker load can be connected though banana connectors J24/J23 for channel #1 and J13/J11 for channel #2. Optional screw connectors J17 and J12 can be used if required.

### 3 Specifications

[TAS2764EVM Parameters Table](#) lists the supply, input and output requirements for TAS2764EVM.

**Table 3-1. TAS2764EVM Parameters**

Parameter	Value
Supply Voltage - VBAT	2.3 V to 5.5 V
Supply Voltage - AVDD	1.65 V to 1.95 V
Supply Voltage - IOVDD	Two ranges: 1.1 V to 1.3 V 1.65 V to 1.95 V
Supply Voltage - PVDD	2.3 V to 16 V
Output Power	13 W
USB, USB class-audio	Micro-USB

## 4 Software

The TAS2764EVM can be easily configured with PPC3 running the TAS2764EVM plug-in. To request access to the software first request a myTI.com account [here](#).

After creating an account, navigate to the TAS2764EVM product page and follow the link in the information box to request access to the software.

For additional information and assist, please contact the TI experts through our [E2E Audio Forum](#).

## 5 Default Jumper Settings

Default jumper settings table shows the default jumpers position.

**Table 5-1. Default jumper settings**

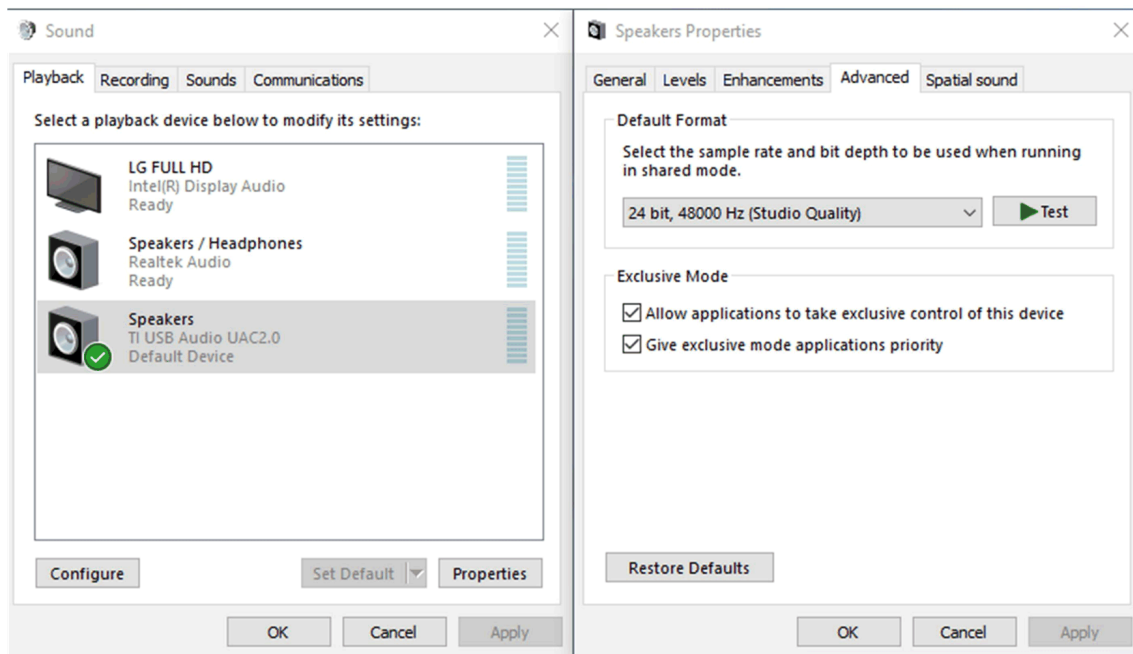
Jumper	Setting	Description
J31	USB (INT)	I2S Source Selection
J29	USB (INT)	I2C Source Selection
J21	Remove	Write protect (install it for inhibit EEPROM write operations)
J5	Remove	USB Disabled
J19	SD_MUX	Shutdown Source
J18	1.8V	IOVDD Level
J3	1.8V	Input Logic Level
J40, J15, J42, J38	Install	PVDD Current Jumpers
J39, J7, J41, J35	Install	VBAT1S Current Jumpers
J26, J20	Install	AVDD Current Jumpers
J27, J34	Install	IOVDD Current Jumpers
J6, J36	Install	Additional VBAT1S 10uF Capacitor
J10	0x70	TAS2764 Channel 1 I2C address selection
J22	0x72	TAS2764 Channel 2 I2C address selection



## 6 EVM Setup

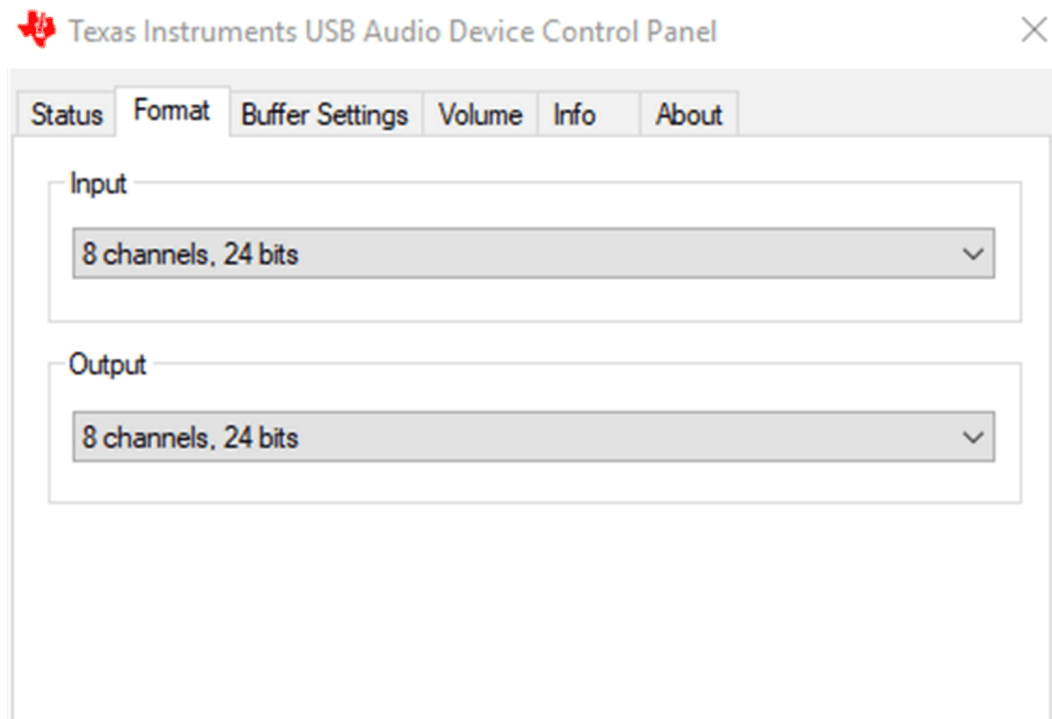
Use the following instructions to complete the setup:

- 1.- Install PPC3 with the TAS2764 plug-in.
- 2.- Connect a speaker to J17. For stereo solution, connect an additional speaker on to J12.
- 3.- Use jumpers J10 and J22 for the I2C address selection. Eighth possible selectable I2C addresses can be selected: 0x70, 0x72, 0x74 0x76, 0x78, 0x7A, 0x7C, 0x7E. Default I2C addresses are 0x70 and 0x72.
- 4.- Connect a 5V supply to connector J16 or J32.
- 5.- Connect a micro USB cable from PC to TAS2764EVM
- 6.- Verify that TI USB Audio UAC2.0 is the default playback device by opening the sound dialog from the Windows Control Panel.



**Figure 6-1. Sound Menu**

- 7.- Set the maximum bit depth using the Texas Instruments USB Audio Device Control Panel found in the system tray.



**Figure 6-2. TI USB Audio Device Control Panel**

8.- Set the sampling rate in Sound Menu ([See Sound Menu Figure for details](#) ).

- Right click TI USB Audio UAC2.0
- Select Properties
- Click Advanced tab
- Select Rate

9.- Configure the device using the TAS2764 PPC3 Plug-in.

## 7 Digital Audio Interfaces

Select the various digital audio interfaces on the TAS2764EVM through hardware and software settings. J28 can be used to input signals from AP or other I2C and I2S signal sources, based on J31 and J29 configuration.

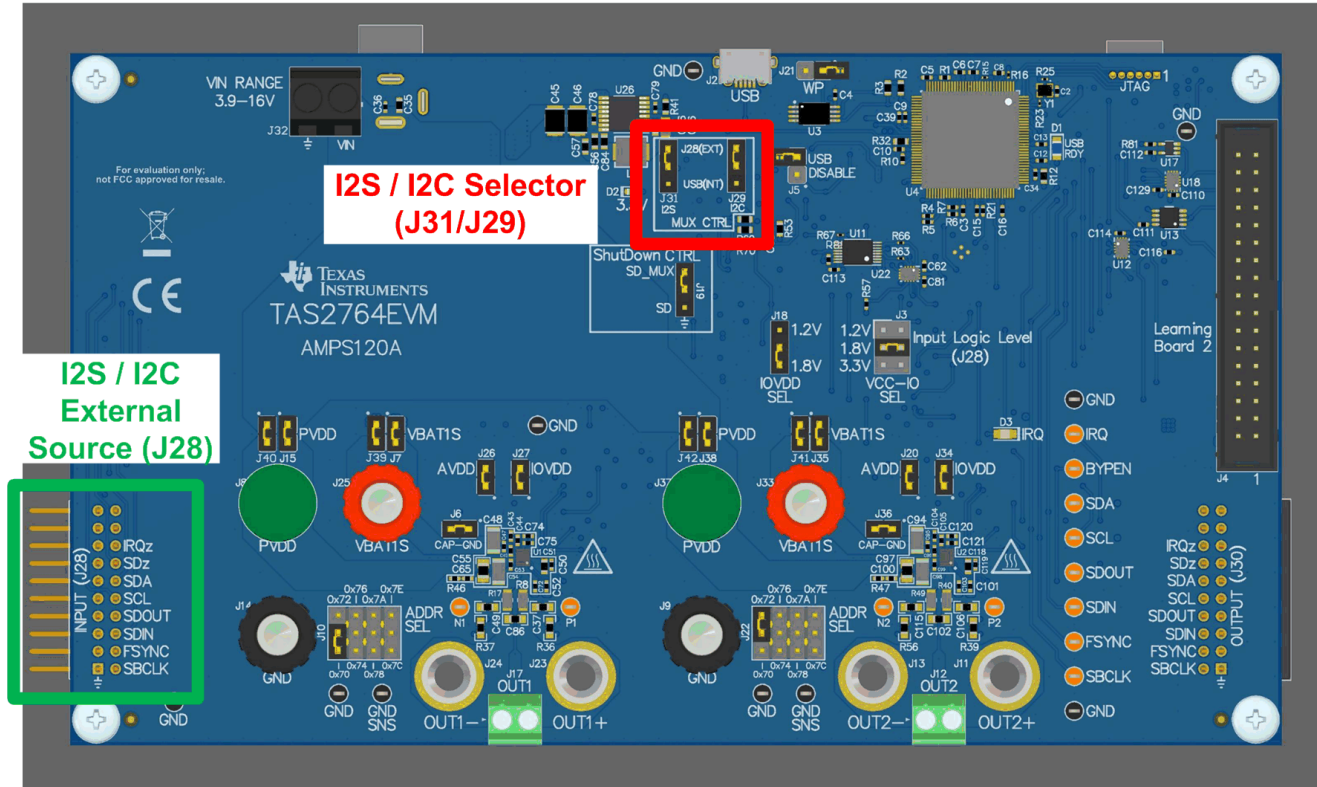


Figure 7-1. I2S/I2C Selector and Source

### 7.1 USB

The TAS2764 Evaluation Board contains an XMOS microcontroller that acts as a USB HID and USB-class audio interface. To select USB, insert the jumpers J31 and J29 in position 2-3 to select the option USB(INT).

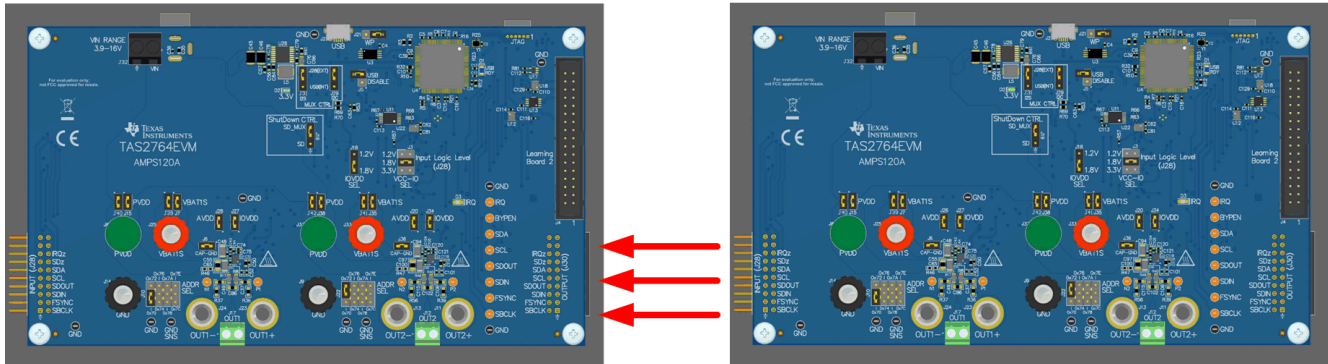
### 7.2 Direct (AP/PSIA)

Insert the jumpers J31 and J29 in positions 1-2 to select J28 (EXT) as the digital audio source (for example AP or PSIA). The odd numbered pins on header J28 provide a ground for each signal. Note that the jumper setting for J3 must reflect the logic level of the external source.

## 8 Multi-Channel Configuration

J30 output connector can be connected to J28 input connector from another TAS2764EVM to allow evaluation of multi-channel applications up to 4 different channels.

Each board must have a different I2C address configuration on J10 and J22.



**Figure 8-1. TAS2764EVM Multichannel Connection**

## 9 TAS2764EVM Schematic

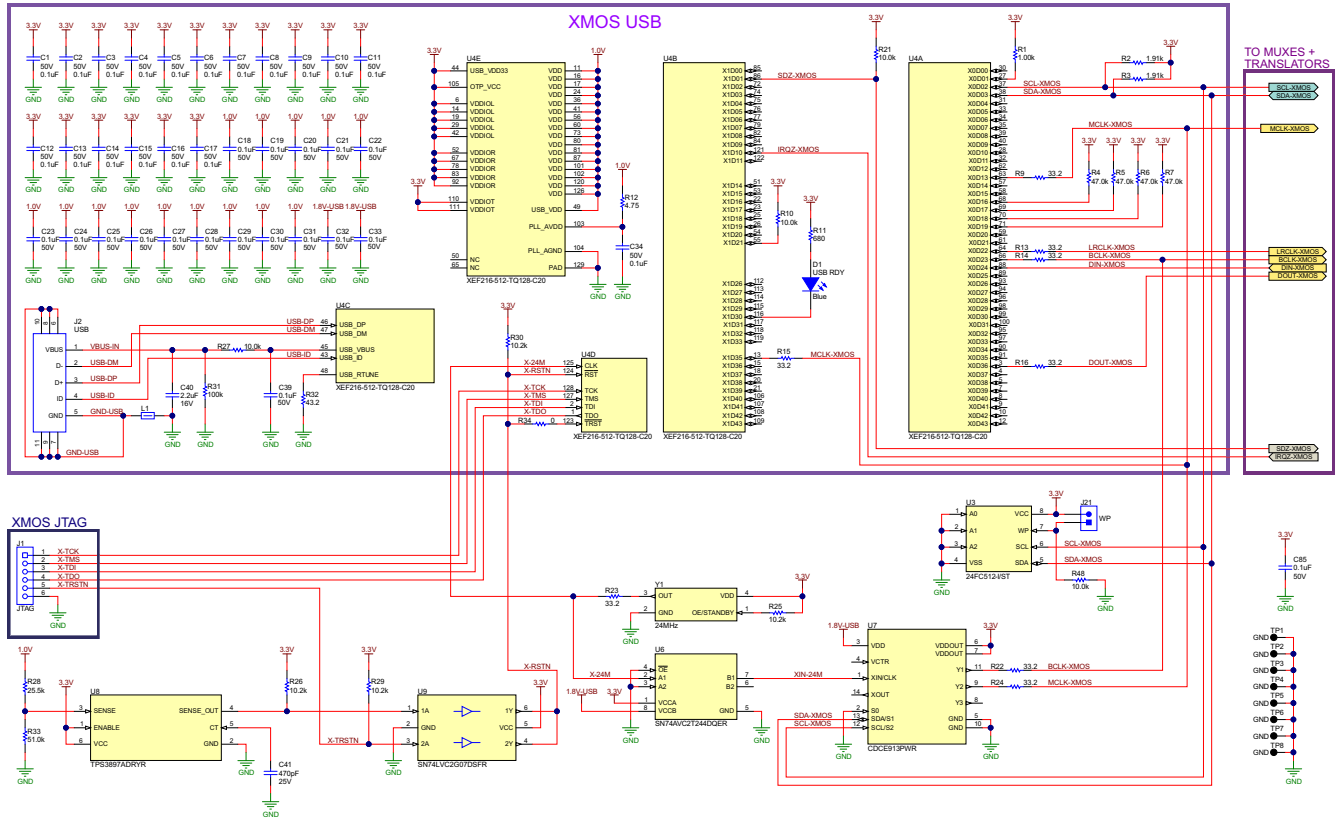


Figure 9-1. TAS2764EVM Schematic (Sheet 1 of 7)

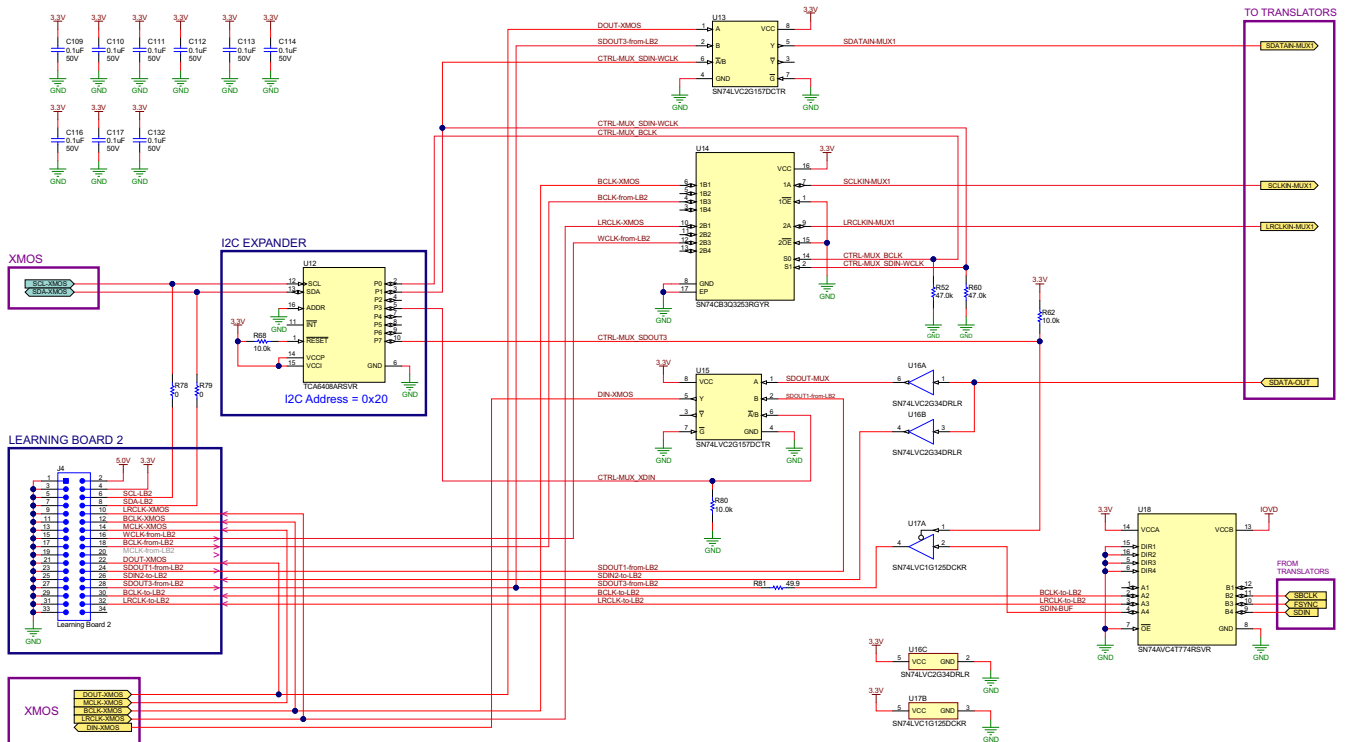


Figure 9-2. TAS2764EVM Schematic (Sheet 2 of 7)

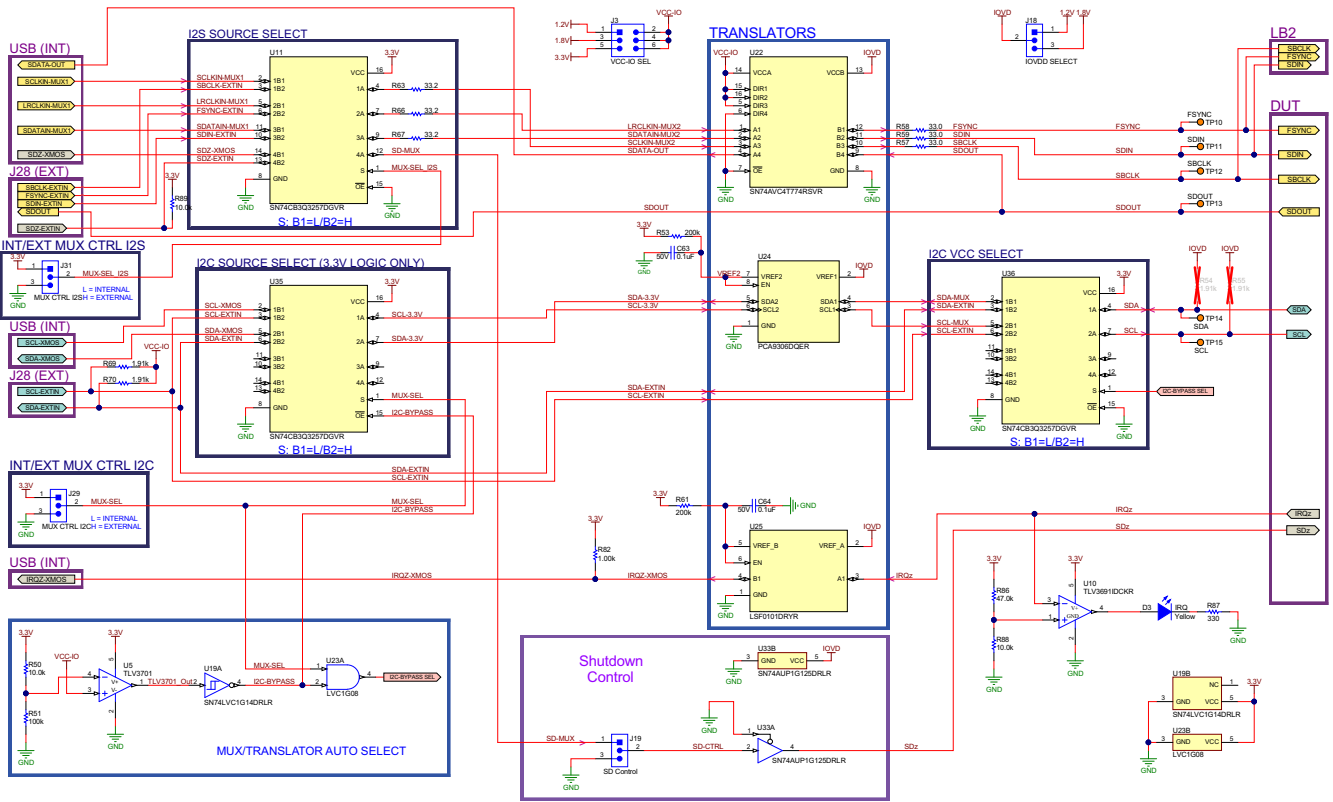


Figure 9-3. TAS2764EVM Schematic (Sheet 3 of 7)

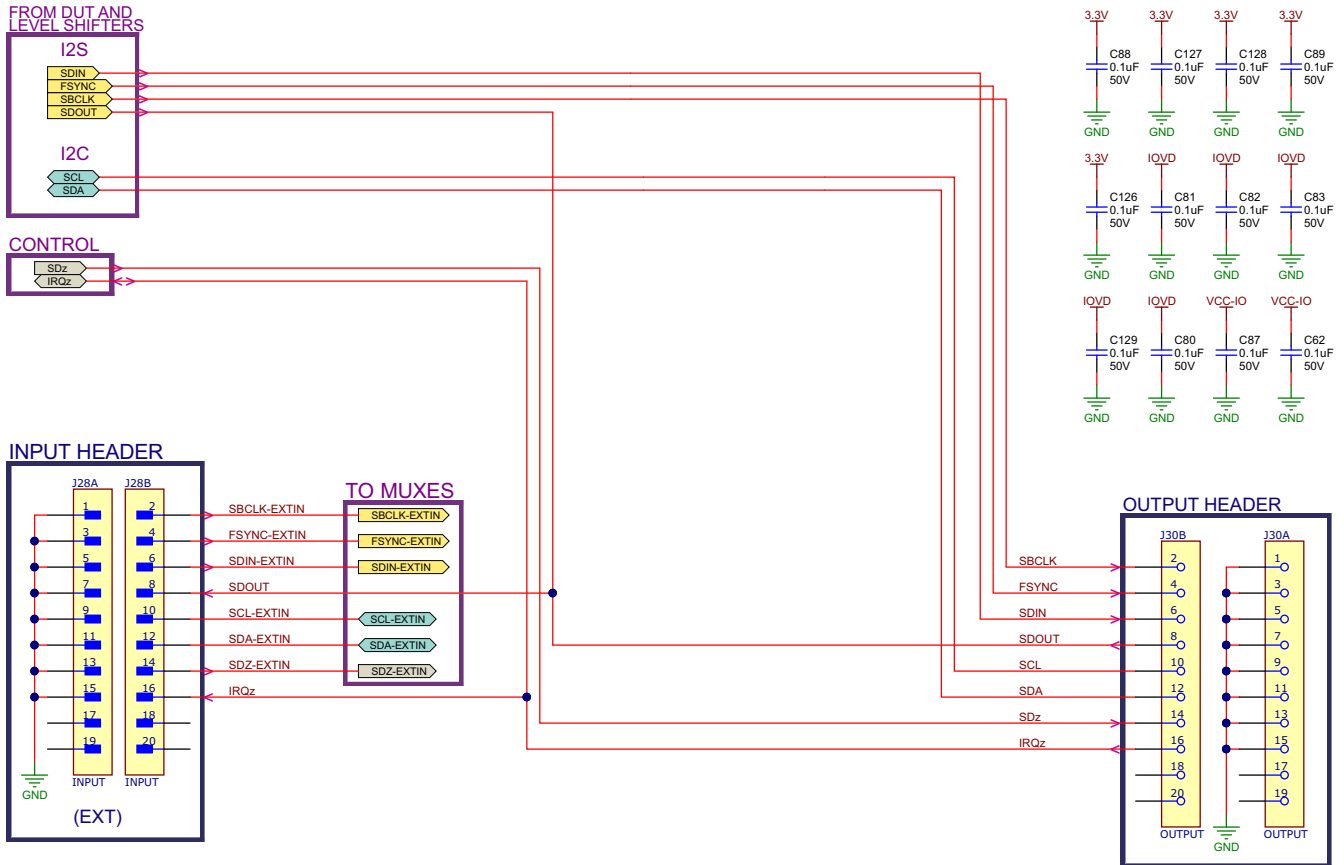


Figure 9-4. TAS2764EVM Schematic (Sheet 4 of 7)

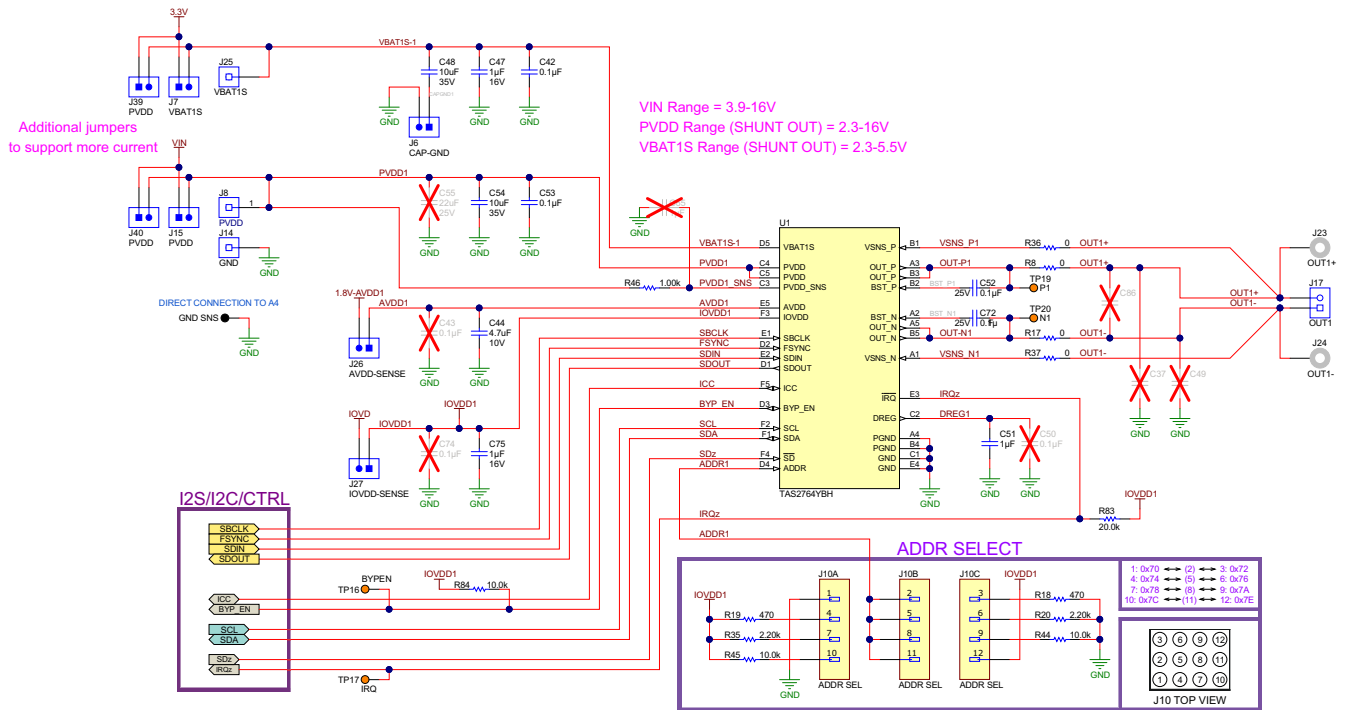


Figure 9-5. TAS2764EVM Schematic (Sheet 5 of 7)

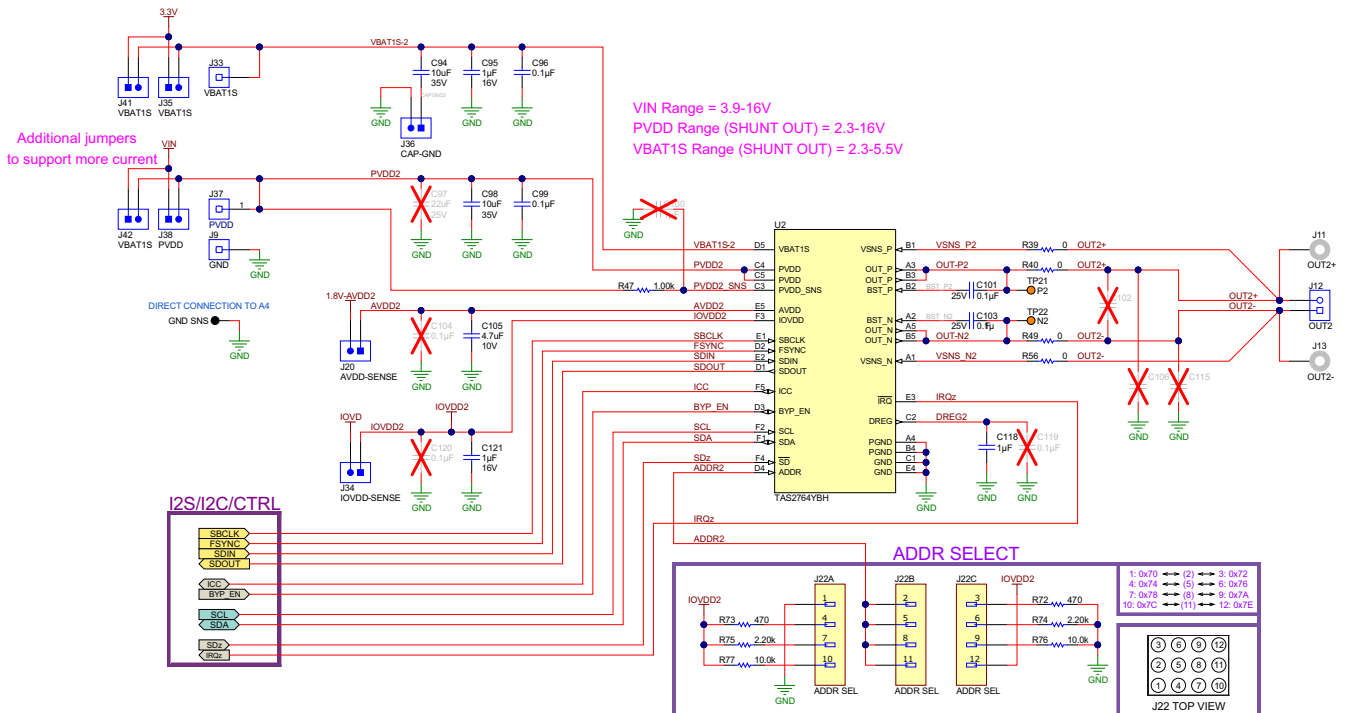


Figure 9-6. TAS2764EVM Schematic (Sheet 6 of 7)

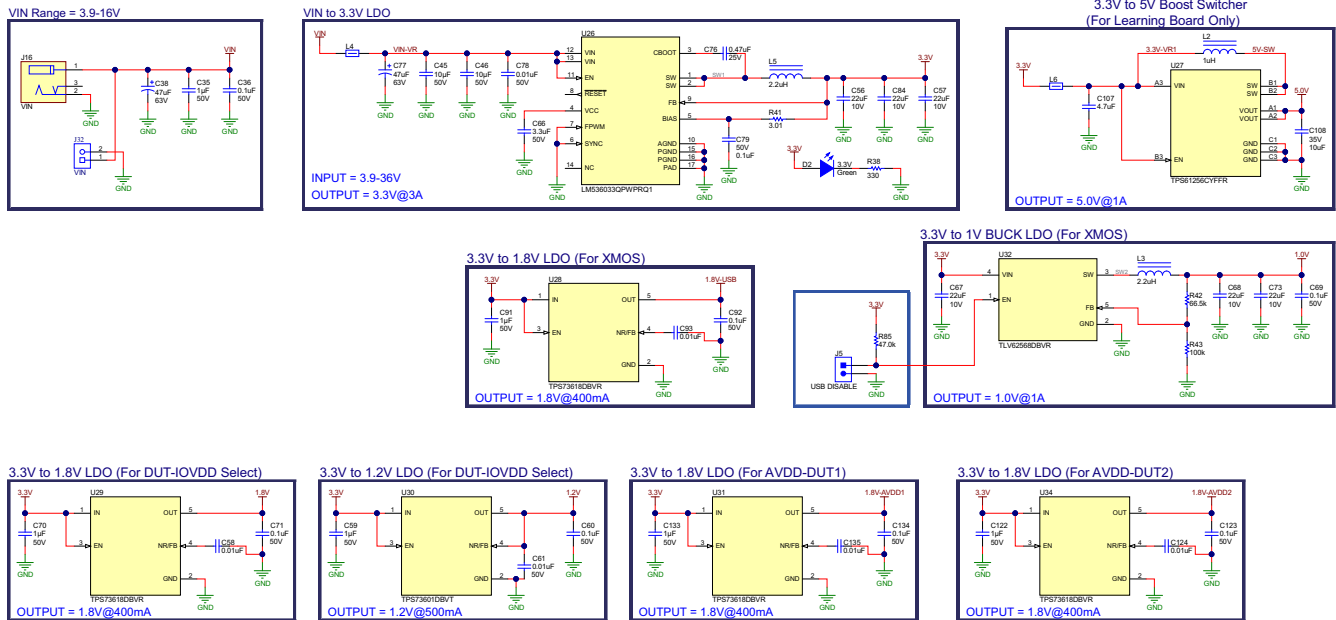


Figure 9-7. TAS2764EVM Schematic (Sheet 7 of 7)



## 10 TAS2764EVM Layout

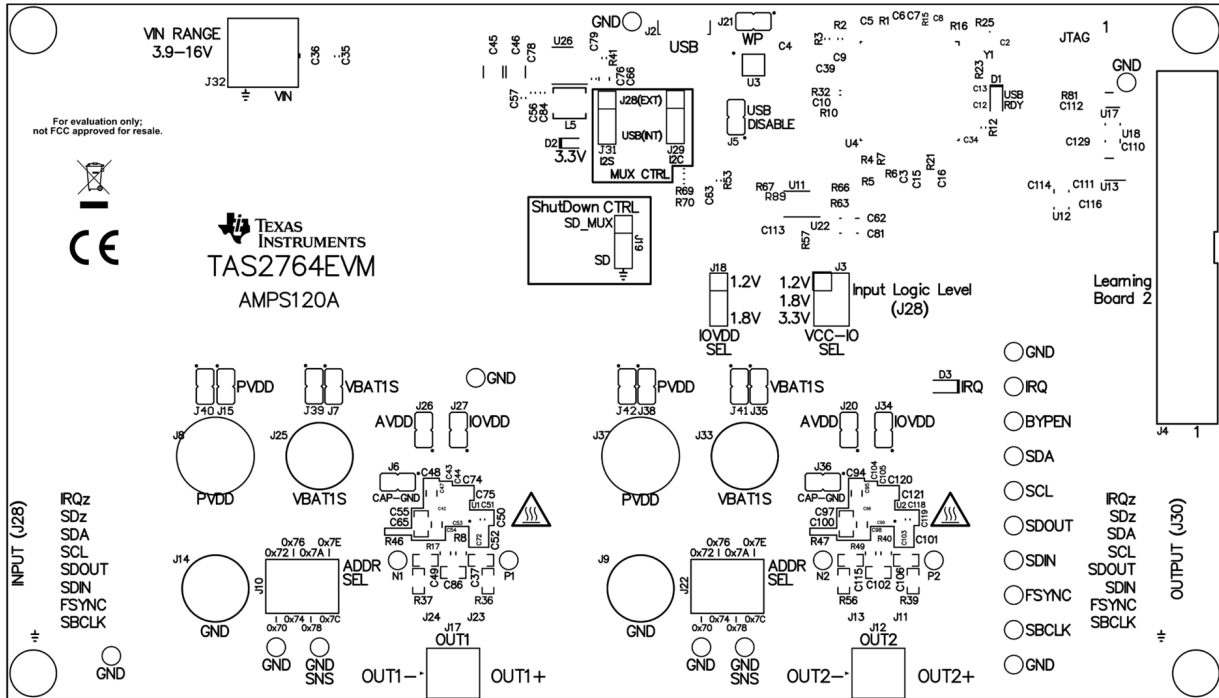


Figure 10-1. TAS2764EVM Top Silkscreen

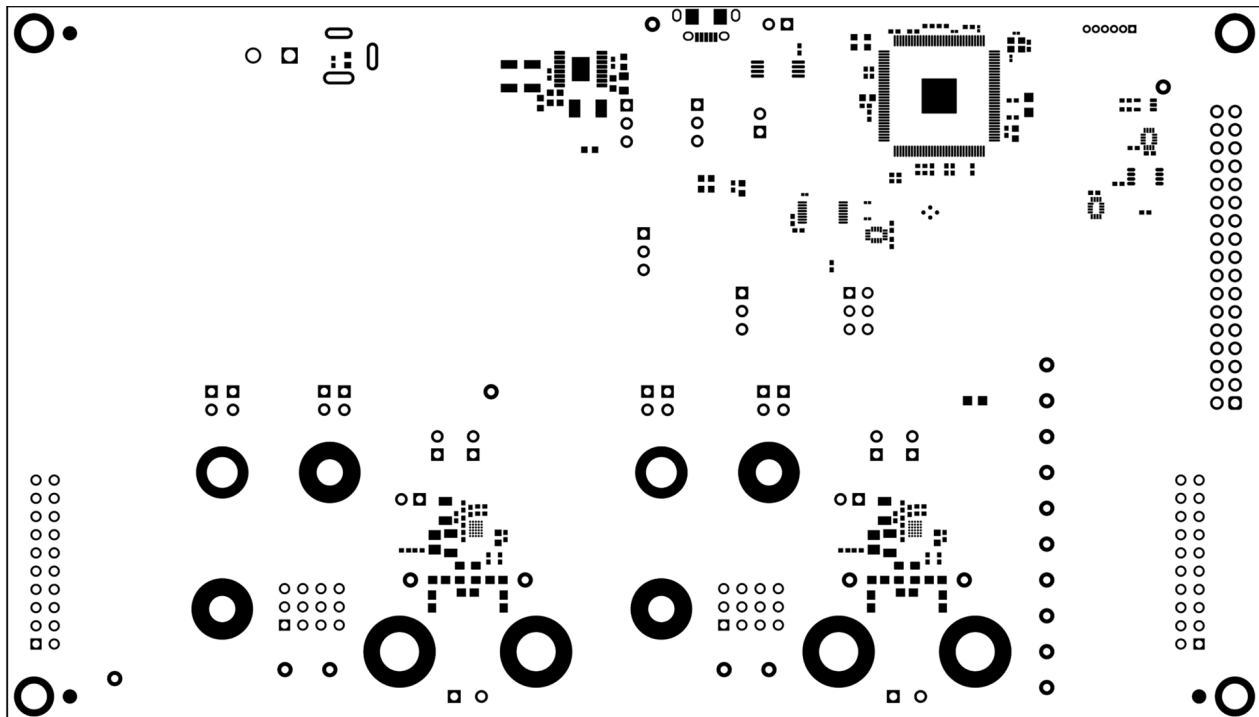
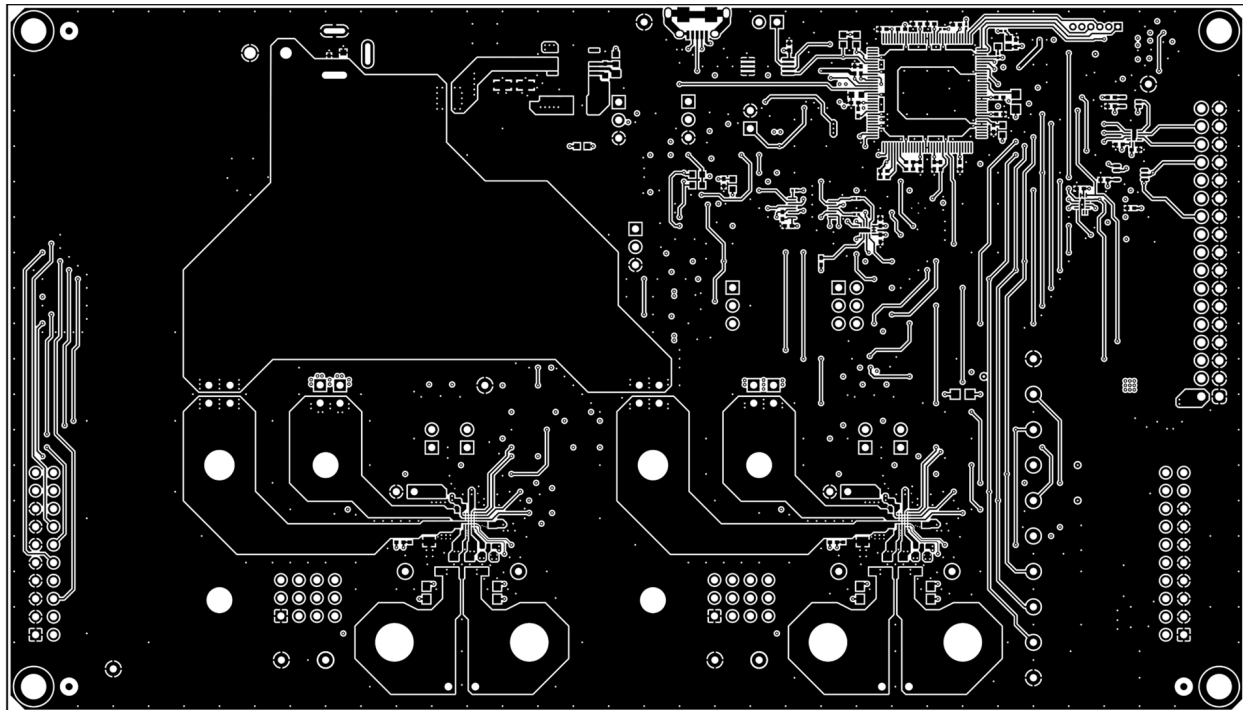
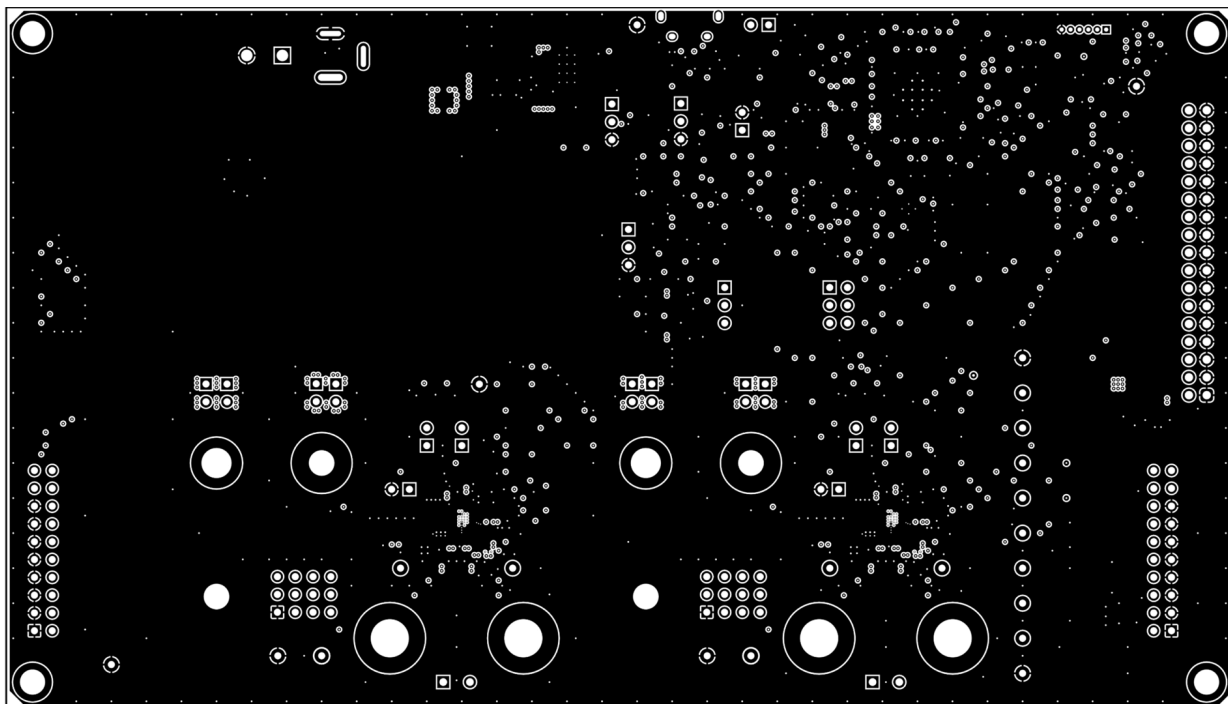


Figure 10-2. TAS2764EVM Top Solder Mask



**Figure 10-3. TAS2764EVM Top Layer**



**Figure 10-4. TAS2764EVM Copper Layer 2**

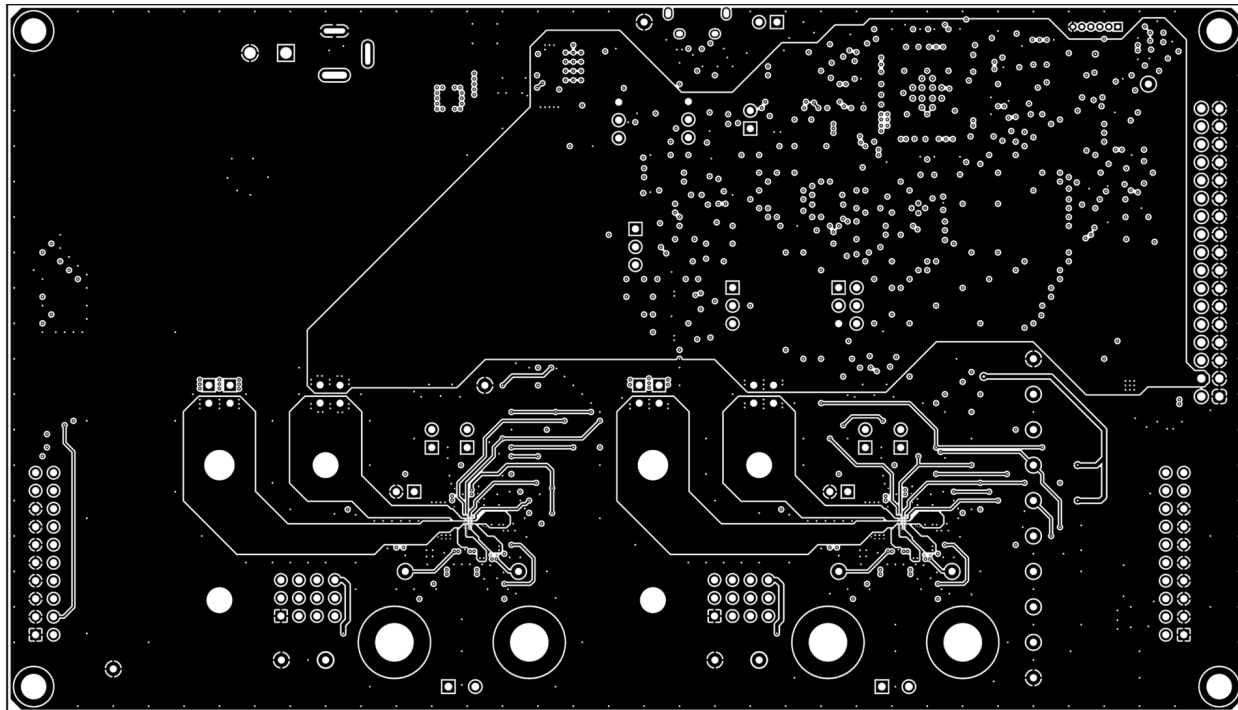


Figure 10-5. TAS2764EVM Copper Layer 3

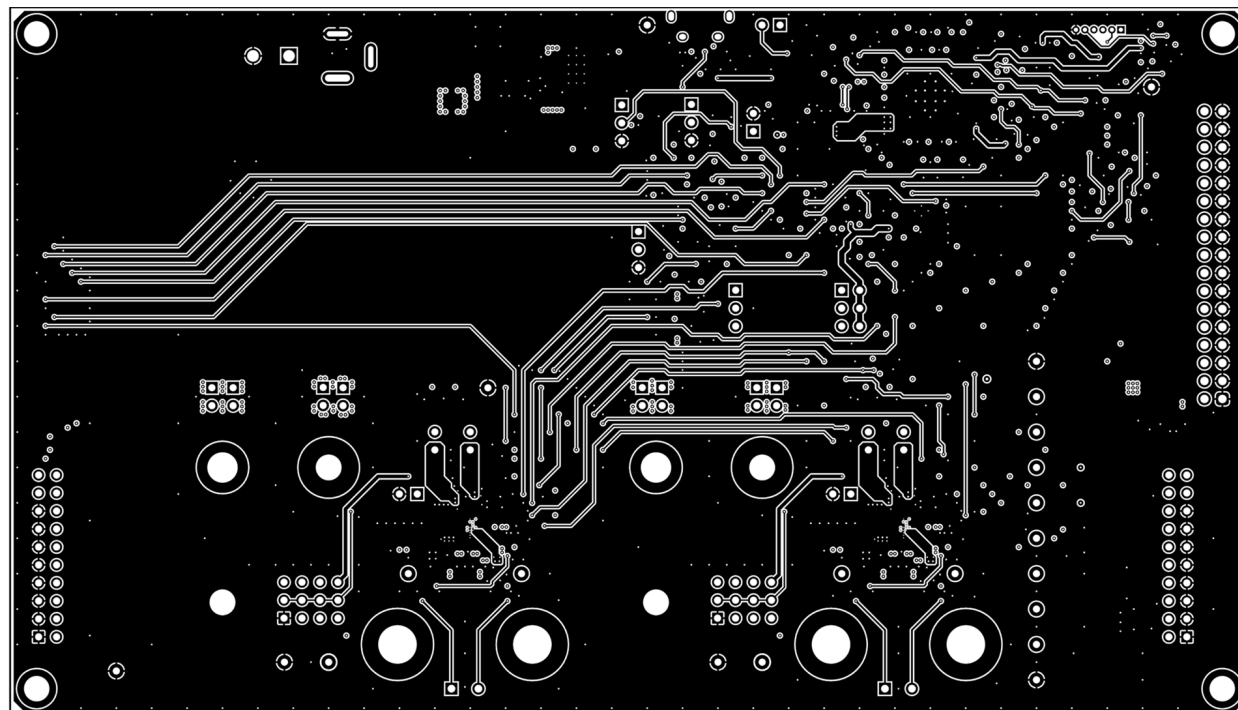


Figure 10-6. TAS2764EVM Copper Layer 4

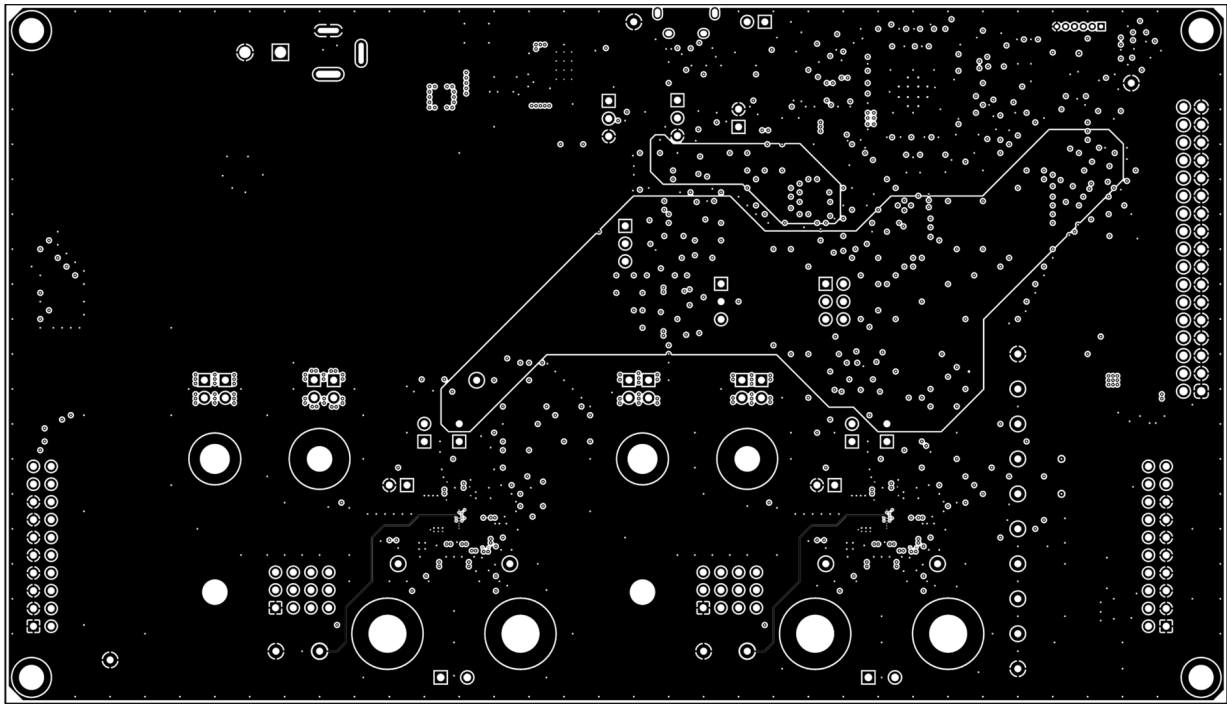


Figure 10-7. TAS2764EVM Copper Layer 5

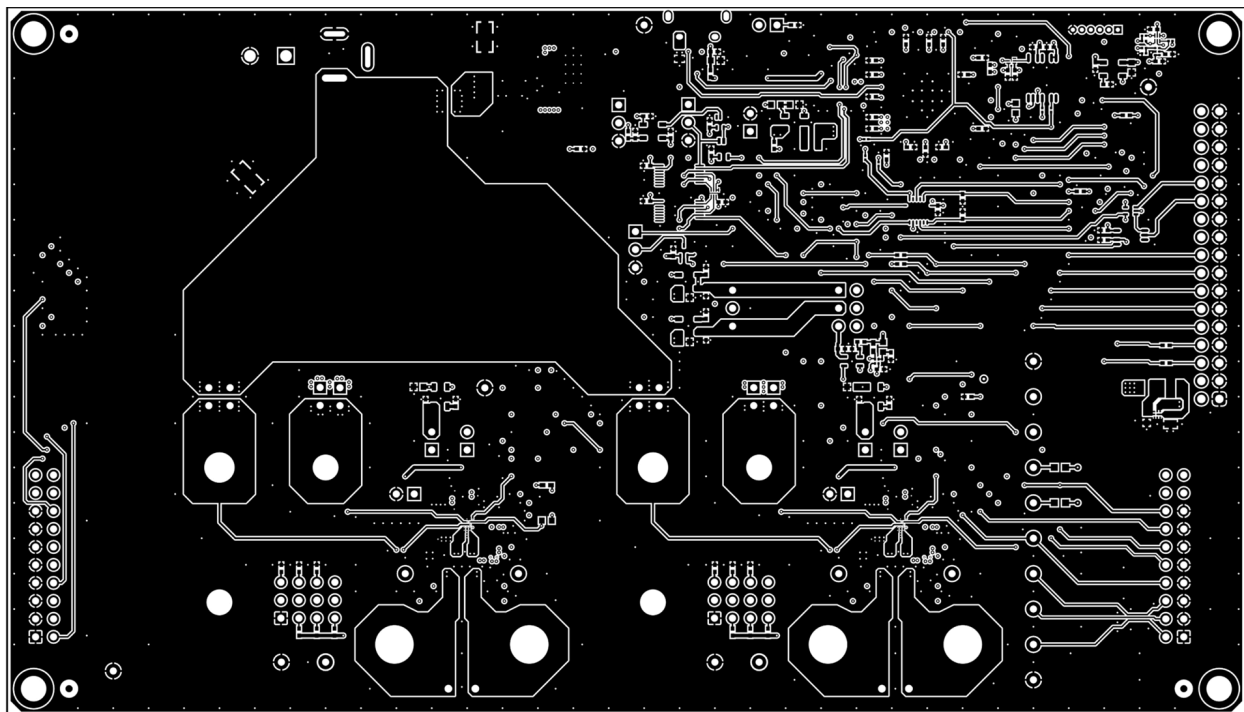


Figure 10-8. TAS2764EVM Bottom Layer

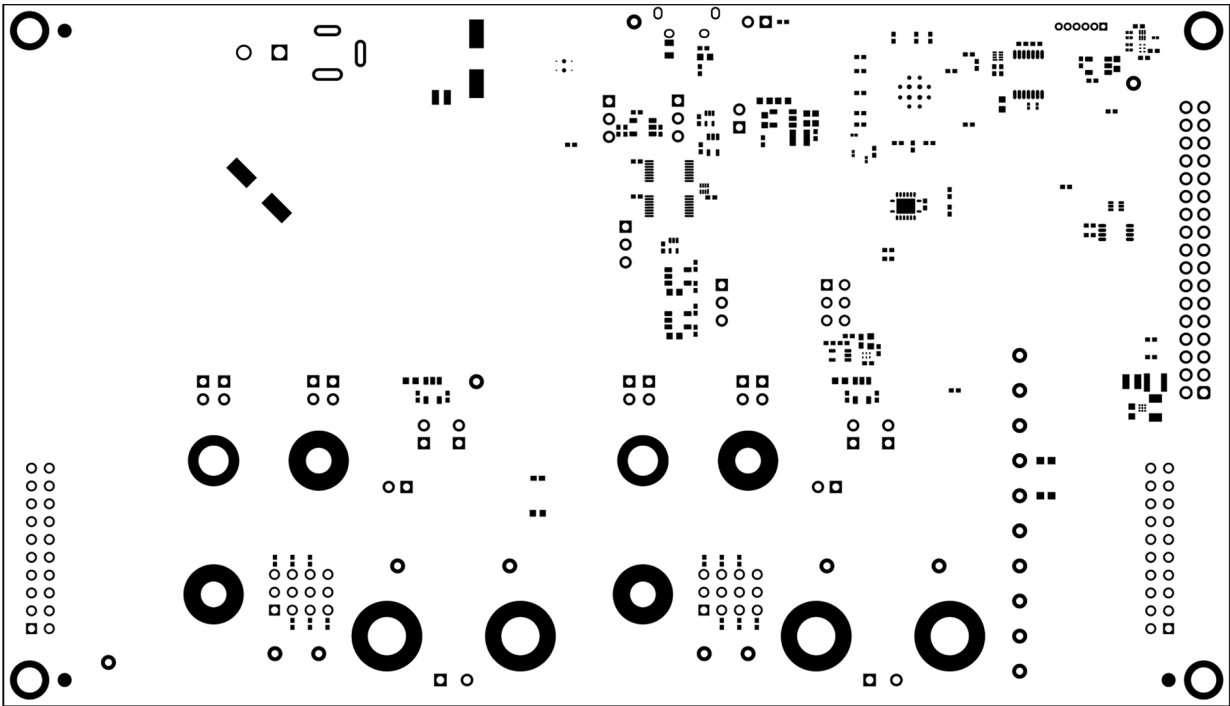


Figure 10-9. TAS2764EVM Bottom Solder Mask

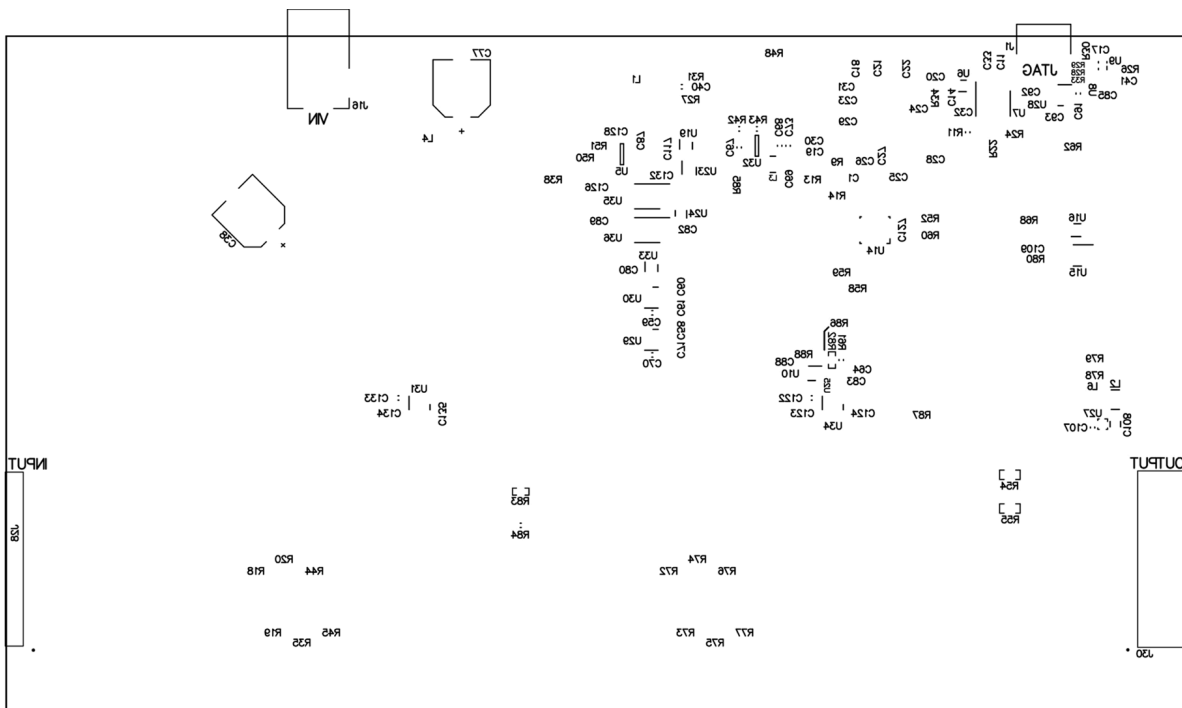
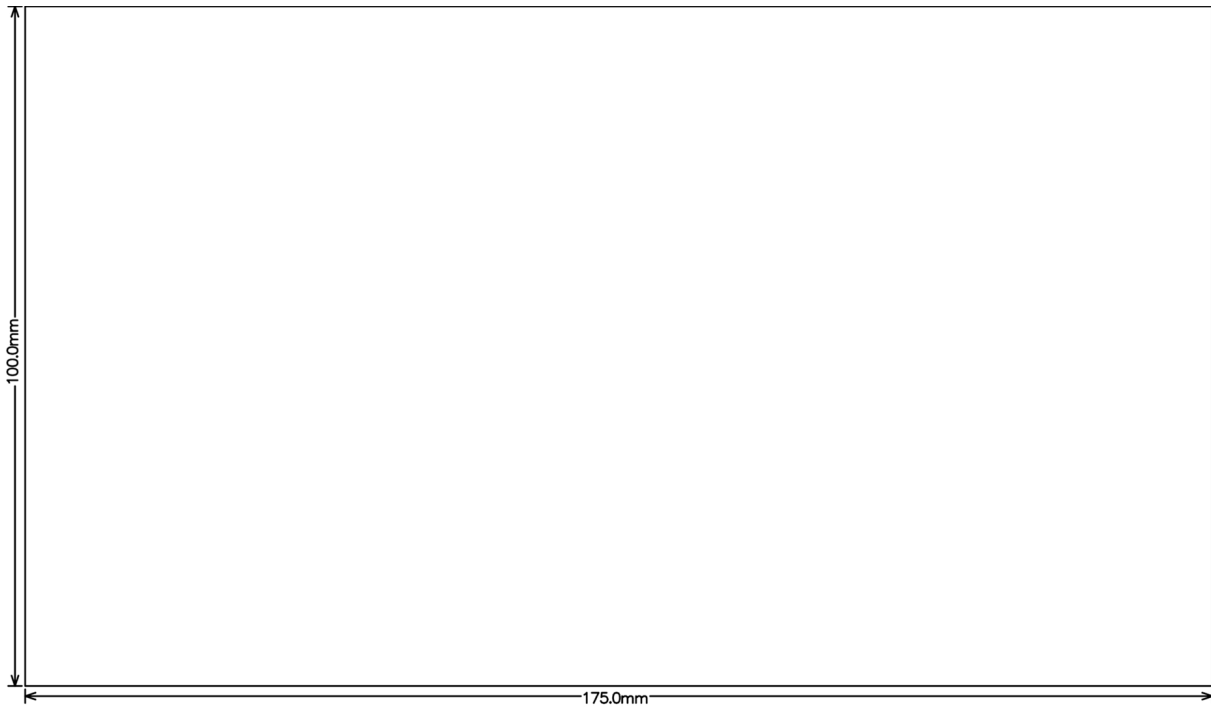


Figure 10-10. TAS2764EVM Bottom Overlay



**Figure 10-11. TAS2764EVM Dimensions**

**11 BOM****Table 11-1. Bill of Materials**

Designator	Quantity	Value	Description	PackageReference	PartNumber	Manufacturer	Alternate PartNumber	Alternate Manufacturer
!PCB1	1		Printed Circuit Board		AMPS120	Any		
C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C36, C39, C60, C62, C63, C64, C69, C71, C79, C80, C81, C82, C83, C85, C87, C88, C89, C92, C109, C110, C111, C112, C113, C114, C116, C117, C123, C126, C127, C128, C129, C132, C134	67	0.1uF	CAP, CERM, 0.1 uF, 50 V, +/- 10%, X7R, 0402	0402	C1005X7R1H104K050BB	TDK		
C35, C59, C70, C91, C122, C133	6	1uF	CAP, CERM, 1 uF, 50 V, +/- 20%, X5R, AEC-Q200 Grade 3, 0603	0603	CGA3E3X5R1H105M080AB	TDK		
C38, C77	2	47uF	CAP, AL, 47 uF, 63 V, +/- 20%, 0.65 ohm, AEC-Q200 Grade 2, SMD	SMT Radial F	EEE-FK1J470P	Panasonic		
C40	1	2.2uF	CAP, CERM, 2.2 uF, 16 V, +/- 10%, X7R, 0603	0603	EMK107BB7225MA-T	Taiyo Yuden		
C41	1	470pF	CAP, CERM, 470 pF, 25 V, +/- 5%, C0G/NPO, 0402	0402	GRM1555C1E471JA01D	MuRata		
C42, C52, C53, C72, C96, C99, C101, C103	8	0.1uF	CAP, CERM, 0.1 uF, 25 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0402	0402	CGA2B3X7R1E104K050BB	TDK		

**Table 11-1. Bill of Materials (continued)**

Designator	Quantity	Value	Description	PackageReference	PartNumber	Manufacturer	Alternate PartNumber	Alternate Manufacturer
C44, C105	2	4.7uF	CAP, CERM, 4.7 uF, 10 V, +/- 10%, X5R, 0402	0402	C1005X5R1A475K050BC	TDK		
C45, C46	2	10uF	CAP, CERM, 10 uF, 50 V, +/- 20%, JB, 1210	1210	C3225JB1H106M250AB	TDK		
C47, C75, C95, C121	4	1uF	CAP, CERM, 1 uF, 16 V, +/- 20%, X5R, 0402	0402	CL05A105MO5N5NNC	Samsung Electro-Mechanics		
C48, C54, C94, C98	4	10uF	CAP, CERM, 10 uF, 35 V, +/- 10%, X7R, AEC-Q200 Grade 1, 1206_190	1206_190	CGA5L1X7R1V106K160AC	TDK		
C51, C118	2	1uF	CAP, CERM, 1 uF, 16 V, +/- 20%, X7R, 0603	0603	CL10B105MO8NNWC	Samsung		
C56, C57, C67, C68, C73, C84	6	22uF	CAP, CERM, 22 uF, 10 V, +/- 20%, X5R, 0603	0603	C1608X5R1A226M080AC	TDK		
C58, C61, C78, C93, C124, C135	6	0.01uF	CAP, CERM, 0.01 uF, 50 V, +/- 10%, X7R, AEC-Q200 Grade 1, 0402	0402	CGA2B3X7R1H103K050B B	TDK		
C66	1	3.3uF	CAP, CERM, 3.3 uF, 50 V, +/- 10%, X5R, 0805	0805	C2012X5R1H335K125AB	TDK		
C76	1	0.47uF	CAP, CERM, 0.47 uF, 25 V, +/- 10%, X7R, 0603	0603	GRM188R71E474KA12D	MuRata		
C107	1	4.7uF	CAP, CERM, 4.7 uF, 16 V, +/- 10%, X5R, 0603	0603	GRM188R61C475KAAJ	MuRata		
C108	1	10uF	CAP, CERM, 10 uF, 35 V, +/- 10%, X7R, 1206_190	1206_190	GMK316AB7106KL-TR	Taiyo Yuden		
D1	1	Blue	LED, Blue, SMD	LED_0805	LTST-C170TBKT	Lite-On		
D2	1	Green	LED, Green, SMD	LED_0603	LTST-C191KGKT	Lite-On		
D3	1	Yellow	LED, Yellow, SMD	0805 LED	LTST-C170KSKT	Lite-On		
H1, H2, H3, H4	4		MACHINE SCREW PAN PHILLIPS M3	M3 Screw	RM3X8MM2701	APM HEXSEAL		



**Table 11-1. Bill of Materials (continued)**

Designator	Quantity	Value	Description	PackageReference	PartNumber	Manufacturer	Alternate PartNumber	Alternate Manufacturer
H5, H6, H7, H8	4		Standoff, Hex,25mm Length, M3, Aluminum	Standoff M3	24438	Keystone		
J1	1		Receptacle, 50mil, 6x1, Gold, R/A, TH	6x1 Receptacle	LPPB061NG CN-RC	Sullins Connector Solutions		
J2	1		Connector, Receptacle, Micro-USB Type AB, R/A, Bottom Mount SMT	Connector, USB Micro AB	DX4R205JJA R1800	JAE Electronics		
J3	1		Header, 100mil, 3x2, Tin, TH	3x2 Header	PEC03DAAN	Sullins Connector Solutions		
J4	1		Header(shrouded), 2.54mm, 17x2, Gold, TH	Header(shrouded), 2.54mm, 17x2, TH	302-S341	On-Shore Technology		
J5, J6, J7, J15, J20, J21, J26, J27, J34, J35, J36, J38, J39, J40, J41, J42	16		Header, 100mil, 2x1, Gold, TH	Sullins 100mil, 1x2, 230 mil above insulator	PBC02SAAN	Sullins Connector Solutions		
J8, J37	2		Binding Post, Bright Tin, Green, TH	Binding Post, Bright Tin, Green, TH	3760-5	Pomona Electronics		
J9, J14	2		Binding Post, BLACK, TH	11.4x27.2mm	7007	Keystone		
J10, J22	2			HDR12	TSW-104-07-G-T	Samtec		
J11, J13, J23, J24	4		Standard Banana Jack, Uninsulated, 5.5mm	Keystone_57 5-4	575-4	Keystone		
J12, J17	2		Conn Term Block, 2POS, 3.81mm, TH	2POS Terminal Block	1727010	Phoenix Contact		
J16	1		Power Jack, mini, 2.5mm OD, R/A, TH	Jack, 14.5x11x9mm	RAPC712X	Switchcraft		
J18, J19, J29, J31	4		Header, 100mil, 3x1, Gold, TH	PBC03SAAN	PBC03SAAN	Sullins Connector Solutions		
J25, J33	2		Binding Post, RED, TH	11.4x27.2mm	7006	Keystone		
J28	1			HDR20	TSW-110-08-G-D-RA	Samtec		
J30	1		20 Position Receptacle Connector Through Hole, Right Angle	HDR20	SSQ-110-02-G-D-RA	SAMTEC		
J32	1		Terminal Block, 5.08mm, 2x1, TH	Terminal Block, 5.08mm, 2x1, TH	0395443002	Molex		

**Table 11-1. Bill of Materials (continued)**

Designator	Quantity	Value	Description	PackageReference	PartNumber	Manufacturer	Alternate PartNumber	Alternate Manufacturer
L1	1	30 ohm	Ferrite Bead, 30 ohm @ 100 MHz, 6 A, 0805	0805	MPZ2012S300AT000	TDK		
L2	1	1uH	Inductor, Flat Wire, 1 uH, 3.1 A, 0.045 ohm, SMD	3.2x1.2x2.5mm	1277AS-H-1R0M=P2	MuRata Toko		
L3	1	2.2uH	Inductor, Multilayer, Ferrite, 2.2 uH, 1.3 A, 0.08 ohm, SMD	SMD, Body 2.5x2mm, Height 1.2mm	LQM2HPN2R2MG0L	MuRata		
L4, L6	2	300 ohm	Ferrite Bead, 300 ohm @ 100 MHz, 3.1 A, 0806	0806	NFZ2MSM301SN10L	MuRata		
L5	1	2.2uH	Inductor, Shielded, 2.2 uH, 4 A, 0.061 ohm, AEC-Q200 Grade 0, SMD	4.45x1.8x4.06 mm	SRP4020TA-2R2M	Bourns		
R1, R46, R47, R82	4	1.00k	RES, 1.00 k, 1%, 0.1 W, 0402	0402	ERJ-2RKF1001X	Panasonic		
R2, R3, R69, R70	4	1.91k	RES, 1.91 k, 1%, 0.1 W, 0603	0603	RC0603FR-071K91L	Yageo		
R4, R5, R6, R7, R52, R60, R85, R86	8	47.0k	RES, 47.0 k, 1%, 0.0625 W, 0402	0402	RC0402FR-0747KL	Yageo America		
R8, R17, R40, R49	4	0	RES, 0, 5%, 0.125 W, 0805	0805	RC0805JR-070RL	Yageo America		
R9, R13, R14, R15, R16, R22, R23, R24, R63, R66, R67	11	33.2	RES, 33.2, 1%, 0.05 W, 0201	0201	RC0201FR-0733R2L	Yageo America		
R10, R21, R27, R44, R45, R62, R68, R76, R77, R80, R88, R89	12	10.0k	RES, 10.0 k, 1%, 0.063 W, 0402	0402	RC0402FR-0710KL	Yageo America		
R11	1	680	RES, 680, 1%, 0.1 W, 0603	0603	RC0603FR-07680RL	Yageo		
R12	1	4.75	RES, 4.75, 1%, 0.1 W, 0603	0603	RC0603FR-074R75L	Yageo		
R18, R19, R72, R73	4	470	RES, 470, 1%, 0.063 W, 0402	0402	RC0402FR-07470RL	Yageo America		
R20, R35, R74, R75	4	2.20k	RES, 2.20 k, 1%, 0.1 W, 0402	0402	ERJ-2RKF2201X	Panasonic		

**Table 11-1. Bill of Materials (continued)**

Designator	Quantity	Value	Description	PackageReference	PartNumber	Manufacturer	Alternate PartNumber	Alternate Manufacturer
R25, R26, R29, R30	4	10.2k	RES, 10.2 k, 1%, 0.05 W, 0201	0201	RC0201FR-0710K2L	Yageo America		
R28	1	25.5k	RES, 25.5 k, 1%, 0.05 W, 0201	0201	RC0201FR-0725K5L	Yageo America		
R31, R51	2	100k	RES, 100 k, 1%, 0.1 W, 0402	0402	ERJ-2RKF1003X	Panasonic		
R32	1	43.2	RES, 43.2, 1%, 0.1 W, 0603	0603	RC0603FR-0743R2L	Yageo		
R33	1	51.0k	RES, 51.0 k, 1%, 0.05 W, 0201	0201	RC0201FR-0751KL	Yageo America		
R34, R78, R79	3	0	RES, 0, 5%, 0.1 W, AEC-Q200 Grade 0, 0402	0402	ERJ-2GE0R00X	Panasonic		
R36, R37, R39, R56	4	0	RES, 0, 5%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	ERJ-3GEY0R00V	Panasonic		
R38, R87	2	330	RES, 330, 1%, 0.1 W, AEC-Q200 Grade 0, 0402	0402	ERJ-2RKF3300X	Panasonic		
R41	1	3.01	RES, 3.01, 1%, 0.1 W, 0603	0603	RC0603FR-073R01L	Yageo		
R42	1	66.5k	RES, 66.5 k, 1%, 0.1 W, 0603	0603	RC0603FR-0766K5L	Yageo		
R43	1	100k	RES, 100 k, 1%, 0.1 W, 0603	0603	RC0603FR-07100KL	Yageo		
R48	1	10.0k	RES, 10.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	RMCF0402FT10K0	Stackpole Electronics Inc		
R50	1	10.0k	RES, 10.0 k, 1%, 0.1 W, 0402	0402	ERJ-2RKF1002X	Panasonic		
R53, R61	2	200k	RES, 200 k, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW0603200KFKEA	Vishay-Dale		
R57, R58, R59	3	33.0	RES, 33.0, 1%, 0.1 W, 0402	0402	ERJ-2RKF33R0X	Panasonic		
R81	1	49.9	RES, 49.9, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	RMCF0402FT49R9	Stackpole Electronics Inc		

**Table 11-1. Bill of Materials (continued)**

Designator	Quantity	Value	Description	PackageReference	PartNumber	Manufacturer	Alternate PartNumber	Alternate Manufacturer
R83	1	20.0k	RES, 20.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040220K0FKED	Vishay-Dale		
R84	1	10.0k	RES, 10.0 k, 1%, 0.1 W, 0603	0603	RC0603FR-0710KL	Yageo		
SH1, SH2, SH3, SH4, SH5, SH6, SH7, SH8, SH9, SH10, SH11, SH12, SH13, SH14, SH15, SH16, SH17, SH18, SH19, SH20, SH21, SH22, SH23	23	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec	969102-0000-DA	3M
TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP18	10		Test Point, Miniature, Black, TH	Black Miniature Testpoint	5001	Keystone		
TP10, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP19, TP20, TP21, TP22	12		Test Point, Miniature, Orange, TH	Orange Miniature Testpoint	5003	Keystone		
U1, U2	2		Digital Input Mono Class-D Audio Amplifier with Speaker IV Sense, WCSP30-YBH	YBH0030	TAS2764YBH	Texas Instruments		Texas Instruments
U3	1		512K I2C Serial EEPROM, TSSOP	TSSOP-8	24FC512-I/ST	Microchip		
U4	1		IC MCU 512KB RAM, 128TQFP	TQFP-128	XEF216-512-TQ128-C20	XMOS semiconductor		
U5	1		Single Nanopower Push-Pull Comparator, DBV0005A (SOT-23-5)	DBV0005A	TLV3701IDBVR	Texas Instruments	TLV3701IDBVT	Texas Instruments
U6	1		Dual-Bit Dual-Supply Bus Transceiver, DQE0008A, LARGE T&R	DQE0008A	SN74AVC2T244DQER	Texas Instruments		

**Table 11-1. Bill of Materials (continued)**

Designator	Quantity	Value	Description	PackageReference	PartNumber	Manufacturer	Alternate PartNumber	Alternate Manufacturer
U7	1		Programmable 1-PLL VCXO Clock Synthesizer with 2.5-V or 3.3-V LVCMOS Outputs, PW0014A (TSSOP-14)	PW0014A	CDCE913PWR	Texas Instruments	CDCE913PW	Texas Instruments
U8	1		Single-Channel Ultra-Small Adjustable Supervisory Circuit With Active-High Open-Drain Output, DRY0006A (USON-6)	DRY0006A	TPS3897ADRYR	Texas Instruments		
U9	1		Enhanced Product Dual Buffer/Driver with Open-Drain Output, DCK0006A (SOT-SC70-6)	DSF0006A	SN74LVC2G07DSFR	Texas Instruments		
U10	1		0.9V to 6.5V, Nano-Power Comparator, DCK0005A (SOT-SC70-5)	DCK0005A	TLV3691IDCKR	Texas Instruments	TLV3691IDCKT	Texas Instruments
U11, U35, U36	3		4-Bit One-of-2 FET Multiplexer/Demultiplexer 2.5-V/3.3-V Low-Voltage, High-Bandwidth Bus Switch, DGV0016A (TVSOP-16)	DGV0016A	SN74CB3Q3257DGVVR	Texas Instruments		Texas Instruments
U12	1		Low-Voltage 8-Bit I2C and SMBus I/O Expander, 1.65 to 5.5 V, -40 to 85 degC, 16-pin UQFN (RSV), Green (RoHS & no Sb/Br)	RSV0016A	TCA6408ARSVR	Texas Instruments		
U13, U15	2		Single 2-Line to 1-Line Data Selector/Multiplexer, DCT0008A, LARGE T&R	DCT0008A	SN74LVC2G157DCTR	Texas Instruments	SN74LVC2G157DCUT	Texas Instruments

**Table 11-1. Bill of Materials (continued)**

Designator	Quantity	Value	Description	PackageReference	PartNumber	Manufacturer	Alternate PartNumber	Alternate Manufacturer
U14	1		Dual 1-of-4 FET Multiplexer/ Demultiplexer 2.5-V/3.3-V Low-Voltage High-Bandwidth Bus Switch, RGY0016A (VQFN-16)	RGY0016A	SN74CB3Q3253RGYR	Texas Instruments		Texas Instruments
U16	1		Dual Buffer Gate, DRL0006A, LARGE T&R	DRL0006A	SN74LVC2G34DRLR	Texas Instruments		Texas Instruments
U17	1		Single Bus Buffer Gate With 3-State Outputs, DCK0005A, LARGE T&R	DCK0005A	SN74LVC1G125DCKR	Texas Instruments		
U18, U22	2		4-Bit Dual-Supply Bus Transceiver With Configurable Voltage-Level Shifting and 3-State Outputs, RSV0016A (UQFN-16)	RSV0016A	SN74AVC4T774RSVR	Texas Instruments		Texas Instruments
U19	1		Single Schmitt-Trigger Inverter, DRL0005A, LARGE T&R	DRL0005A	SN74LVC1G14DRLR	Texas Instruments		Texas Instruments
U23	1		Single 2-Input Positive-AND Gate, DCK0005A, LARGE T&R	DCK0005A	SN74LVC1G08DCKR	Texas Instruments		
U24	1		Dual Bi-Directional I2C-Bus and SMBus Voltage Level-Translator, 0 to 5.5 V, -40 to 85 degC, 8-pin X2SON (DQE), Green (RoHS & no Sb/Br)	DQE0008A	PCA9306DQER	Texas Instruments		
U25	1		Single Bi-Directional Multi-Voltage Level Translator, DRY0006A (USON-6)	DRY0006A	LSF0101DRYR	Texas Instruments		

**Table 11-1. Bill of Materials (continued)**

Designator	Quantity	Value	Description	PackageReference	PartNumber	Manufacturer	Alternate PartNumber	Alternate Manufacturer
U26	1		3.5 to 36Vin, 3 Ampere Synchronous DC-DC Converter for Automotive Applications, PWP0016D (TSSOP-16)	PWP0016D	LM536033QP WPRQ1	Texas Instruments	LM536033QP WPTQ1	Texas Instruments
U27	1		3.5-MHz High Efficiency Step-Up Converter in Chip Scale Package, YFF0009ACAG (DSBGA-9)	YFF0009ACAG	TPS61256CY FFR	Texas Instruments	TPS61256CY FFT	Texas Instruments
U28, U29, U31, U34	4		Single Output LDO, 400mA, Adj.(1.2 to 5.5V), Cap free, Low Noise, Reverse Current Protection, DBV0005A (SOT-23-5)	DBV0005A	TPS73618DB VR	Texas Instruments		
U30	1		Single Output LDO, 400mA, Adj.(1.2 to 5.5V), Cap free, Low Noise, Reverse Current Protection, DBV0005A (SOT-23-5)	DBV0005A	TPS73601DB VT	Texas Instruments		
U32	1		1-A High Efficiency Step-Down Converter in SOT23-5 Package, DBV0005A, DBV0005A (SOT-5)	DBV0005A	TLV62568DB VR	Texas Instruments	TLV62568DB VT	Texas Instruments
U33	1		Low-Power Single Bus Buffer Gate with 3-State Output, DRL0005A, LARGE T&R	DRL0005A	SN74AUP1G 125DRLR	Texas Instruments		Texas Instruments
Y1	1		OSC, 24 MHz, 2.25 - 3.63 V, SMD	2x1.6mm	ASTMLPA-24.000MHZ-EJ-E-T	Abracon Corporation		
C37, C49, C86, C102, C106, C115	0	1uF	CAP, CERM, 1 µF, 16 V, +/-20%, X7R, 0603	0603	CL10B105MO 8NNWC	Samsung		

**Table 11-1. Bill of Materials (continued)**

Designator	Quantity	Value	Description	PackageReference	PartNumber	Manufacturer	Alternate PartNumber	Alternate Manufacturer
C43, C50, C74, C104, C119, C120	0	0.1uF	CAP, CERM, 0.1 $\mu$ F, 25 V, $\pm$ 10%, X7R, AEC-Q200 Grade 1, 0402	0402	CGA2B3X7R1E104K050B	TDK		
C55, C97	0	22uF	CAP, CERM, 22 $\mu$ F, 25 V, $\pm$ 20%, X5R, 0805	0805	GRM21BR61E226ME44L	MuRata		
C65, C100	0	1uF	CAP, CERM, 1 $\mu$ F, 16 V, $\pm$ 20%, X5R, 0402	0402	CL05A105MO5NNNC	Samsung Electro-Mechanics		
FID1, FID2, FID3, FID4, FID5, FID6	0		Fiducial mark. There is nothing to buy or mount.	N/A	N/A	N/A		
R54, R55	0	1.91k	RES, 1.91 k, 1%, 0.1 W, 0603	0603	RC0603FR-071K91L	Yageo		



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